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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/785,352	02/24/2004	Harsha S. Nagesh	10-26-12-10-40	8735

7590 12/18/2007

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EXAMINER	
GANDHI, ANKIT P	

ART UNIT	PAPER NUMBER
2616	

MAIL DATE	DELIVERY MODE
12/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/785,352	NAGESH ET AL.	
	Examiner	Art Unit	
	Ankit P. Gandhi	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

- Rejection 35 U.S.C. 101 regarding claim 19 has been withdrawn.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 6, 9-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abel et. al., Pub. No.: US 2005/ 0152354, (hereinafter referred as, Abel) in view of Shenoy et. al., Patent No.: US 7,164,658.

Regarding claims 1, 16 and 19, Abel discloses an apparatus for use in processing a traffic flow in a communication network (figure 1, network processing system) comprising a plurality of nodes (as disclosed in figure 1, network processors A-D), the apparatus comprising: a processing device (figure 2 further explained in respect to figure 1, comprising network processors 110-1 to 110-4) comprising a processor coupled (referring to figure 2, as network processors 110-1 to 110-4 are coupled to sequenced load balancer 100) to a memory (wherein sequenced load balancer 100 further comprising packet memory 255, queue pointer memory 280, and balance history memory 215),

a processing device being operative to split the traffic flow (dynamically distributing packet flows over network, column 3, paragraph 0047) into a plurality of parts, and to distribute the parts to respective ones of the plurality of nodes (figure 2, network processors 110-1 to 110-4) that are designated as participating in a load balancing process (figure 2, and column 3, paragraph 0047, wherein each network processors are attached with sequence load balancer 100 and also referring to figure 4, column 4, paragraph 0060, lines 2-6, wherein packet flow is dynamically distributed over network processors (NP) A1, B1, C1 and D1) for the traffic flow;

wherein each of at least a subset of the participating nodes receiving one of the parts routes at least a portion of its received part to one or more destination nodes (figure 4, paragraph 0060, column 4-5, lines 5-10, wherein packets are recombined in sequence load balancer 100-2, and be transmitted to a *network or network device* through outgoing port 130-*v*) of the plurality of nodes.

Abel discloses all the claimed limitation as disclosed above, however Abel fails to teach wherein at least a first one of the participating nodes receiving one of the parts routes at least a portion of its received part to at least a second one of the participating nodes receiving another one of the parts.

Shenoy discloses virtual citrus with an IP route, where transfer load on the IP route is distributed on the virtual circuits (abstract). Shenoy further discloses in figure 3, wherein a forwarding block 320 receives an IP datagram from inbound interface 310, and determines an IP route the datagram is to be forwarded on, and the destination IP address is compared against entries in forwarding table 325 to retrieve a route entry,

where as VC determination block 330 determines the specific one of the virtual circuits to use in forwarding a layer-3 datagram, because the datagrams to edge router 160 can be transmitted on any one of the two PVCs, VC determination block 330 needs to determine the specific one of the PVCs to use for transmitting each datagram, and the IP address of the edge router is used as an index to retrieve the circuit identifiers (VPI/VCI) of the associated PVCs, and one of the two PVCs is then selected for each datagram, which approach can be used in balancing the traffic load on the two PVCs.

Shenoy further discloses segmentation block 340 segments each IP datagram into several ATM payload, and encapsulator 350 receives each payload and encapsulates the payload into a corresponding ATM cell, whereas the header for each cell is constructed based on a VPI/VCI received from VC determination block 330, and the same VPI/VCI is used to encapsulate all cells of a datagram (column 5, lines 9-47)

Therefore, it would have been obvious to one skill in the art at the time invention was made to combine teaching of Shenoy in the system of Abel, because once the packet flow is dynamically distributed over network processor, implementing teaching of virtual circuitry in the each network processor, in order to further transfer divided flow into virtual circuit, which can further communicate with another virtual circuit located in different network processor who has received respective received parts to one another. One is motivated to do so; because routing divided segments of data from one network processor to another network processor via virtual circuitry can release consumed bandwidth for particular network processor; because due to such high distribution, a

high aggregate bandwidth may not be available for data transfer in order to recombine divided data in sequence load balancer, and to be further transmitted to a network or network device through port, however routing divided segment from one node to another, can allow smooth packet transfer and recombination and also eliminate packet loss and provide successful transmission to output port.

Regarding claim 17, Abel discloses the apparatus of claim 16, wherein the processing device comprises one of the participating nodes of the network (column 3, paragraph 0047, wherein packet are being transmitted and received to/from network processors 110-1 to 110-4).

Regarding claim 18, Abel discloses the apparatus of claim 16, wherein the processing device is implemented as one or more integrated circuits (figure 2, network processor 110-1 to 110-4, wherein network processor inherently has to have one or more integrated circuit and program instruction to process dynamically distributed traffic).

Regarding claim 2, Abel disclose a method of claim 1, wherein the traffic flow comprises an incoming packet flow arriving at a given one of the nodes (column 3, paragraph 0047, wherein packet are being transmitted and received to/from network processors 110-1 to 110-4).

Regarding claim 3, Abel discloses a method of claim 1, wherein the traffic flow is split into the plurality of parts in a manner independent of the one or more destination nodes (column 2, paragraph 0033, lines 1-8).

Regarding claim 6, Abel discloses a method of claim 1, wherein traffic flow comprises virtually-concatenated data traffic (column 2, paragraph 0033, wherein packets are being processed in respect to network processor, and sequenced load device analyzes the incoming packet flows, distribute packets to independent network processors, and recombine in load balancer 100 to transmitted back to link, therefore, it is well-known to one skilled in art that such system should inherently have virtual concatenated data traffic; which is being split for processing purpose in the system and linked together for output).

Regarding claim 9, Abel discloses the method of claim 1, wherein the traffic flow is split into the plurality of parts utilizing a virtual concatenation technique (figure 2, parser 205, and column 3, paragraph 0050, capable of providing flexibility in terms of number and types of extracted flow identifiers and also further parser herein referred as, means for capable of extracting a configurable set of classifier a bit pattern).

Regarding claim 10, Abel discloses the method of claim 1, wherein the traffic flow is split into the plurality of parts in such a manner that a desired packet format of the traffic flow is maintained in each of the plurality of parts. (column 3, paragraph 0048,

lines 17-19, wherein Hash function unit 210 ascertains that packets belonging to a same flow are identified with identical flow bucket, and also referring to column 5, paragraph 0060, lines 5-10, wherein load-balancer still keeping packet order, to be transmitted to a network or network device through outgoing port).

Regarding claim 11, Abel discloses the method of claim 1, wherein the parts of the traffic flow are distributed to the respective ones of the participating nodes over pre-provisioned circuits (figure 2, sequence load balancer device 100 attached with network processors 110-1 to 110-4 or more and column 3, paragraph 0047, lines 8-9) each configured to support a corresponding one of the parts.

Regarding claim 12, Abel discloses the method of claim 1, wherein a given one of the participating nodes routes at least a portion of its received part to a set of destination nodes (figure 2, switching unit 285, lines 10-12, switching unit analyzes packet headers to determine outgoing port, therefore it is well known to one skilled in the art that switching unit inherently has to evaluate source and destination address from packet header portion) determined based on destination addresses in packet headers of the portion.

Regarding claims 13 and 14, Abel discloses the method of claim 1, wherein if the packet header of a given packet in the part of the flow received by a given one of the participating nodes (column 4, paragraph 0056, balance history memory 215 is used by

queue/dequeue unit 265 to determine whether processed packet has to be stored to packet memory 255 or to be transferred to outgoing port) indicates that the participating node is a final destination node for that packet, the packet is stored in a resequencing buffer of the participating node.

Regarding claim 15, Abel discloses the method of claim 1, wherein at least one of the splitting step and the distributing step is implemented at least in part in software running on a processor of a node or other element of the network (figure 2, sequenced load balancer device 100 for dynamically distributing packet flows over network processing unit and also further referring to claim 11).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abel et. al., Pub. No.: US 2005/ 0152354, (hereinafter referred as, Abel) in view of Worfolk et. al., Pub. No.: US 2003/ 0128687, (hereinafter referred as, Workfolk).

Regarding claims 4 and 5, Abel discloses all the limitation as disclosed above. However, Abel fails to teach a method, wherein traffic flow is split into a plurality of equal parts and at least two of which comprise non-equal parts.

Worfolk discloses a multi-path dynamic routing algorithm using traffic allocation; wherein data can use either only the Best N path based upon remaining bandwidth left on each path. Furthermore, allocation of traffic load between these paths can be equal (herein referred as a, equal parts) or dependent (herein referred as, non-equal) on the path metrics of these paths (column 7, paragraph 0090 and paragraph 0094, and 0096).

Therefore, it would have been obvious to one skill in the art at the time invention was made to implement a logic of Worfolk in the system of Abel, because when packets are being transmitted using maximum bandwidth via path A to F, and path B and D are using maximum bandwidth to transmit packets to F by splitting the traffic flow in equal amount between B and D; and on the other hand, wherein path A and C are using maximum bandwidth to transmit packet to E, then only one dependent (non-equal) path C will be used since B and D are sharing equal amount of load for F.

6. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abel et. al., Pub. No.: US 2005/ 0152354, (hereinafter referred as, Abel) in view of Schwartz et. al., Patent No.: 6,553,035, (hereinafter referred as, Schwartz).

Regarding claims 7 and 8, Abel discloses a method of claim 1, wherein the traffic flow is split into N parts (it is well known to one skilled in the art that such system should inherently split or divide packet into N (herein referred N as an infinite, parts based upon receiving ratio of the traffic) at a given one of the nodes by maintaining N queues (column 4, paragraph 0057, lines 1-2, wherein packet queue and dequeue unit 265 analyzes balance history of received traffic which is queued and being maintain by unit 265) at the given node.

Abel discloses all the aspects of the claimed invention above; however Abel fails to teach a method of filling the queues from the traffic flow in accordance with a specified queue-filling technique comprises round-robin and shortest queue first technique.

Schwartz discloses a method and system for queuing data within switching node on a network. Schwartz further discloses the control selection circuit; which selects the short queues to enable transfer data in a round-robin fashion, and also determines whether each queue has data to be transferred, and if no data is to be transferred, the queue can be skipped. (column 3, lines 5-20 and column 4, lines 35-45).

Therefore, it would have been obvious to one skill in the art at the time invention was made to implement a control selection circuit of Schwartz in the system of Abel; which can select shortest queue first in a round-robin manner. One is motivated to do so because such technique can result in saving the time that would have been allocated for retrieval of data from the particular short queue (column 3, lines 14-16), and also selecting the shortest queue first instead of fewer long queues, the overall system is

more efficient and inexpensive to implement (referring to *Abstract*) and it further allows more processing and efficient time to process longest data packet queue.

Conclusion

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ankit P. Gandhi whose telephone number is 571-270-3009. The examiner can normally be reached on Monday-Friday - 9:00 to 5:00 (Altern: Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

APG

RICKY Q. NGO
SUPERVISORY PATENT EXAMINER